Restoration Ecology Primer

Figure slides for chapters 1-5.

How to use these slides

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Cover Photo. Sacramento River National Wildlife Refuge with ~15-yr old actively restored riparian forest in foreground, and remnant forest and natural recruitment on a sandbar across the river. Photo credit: Rich Reiner.

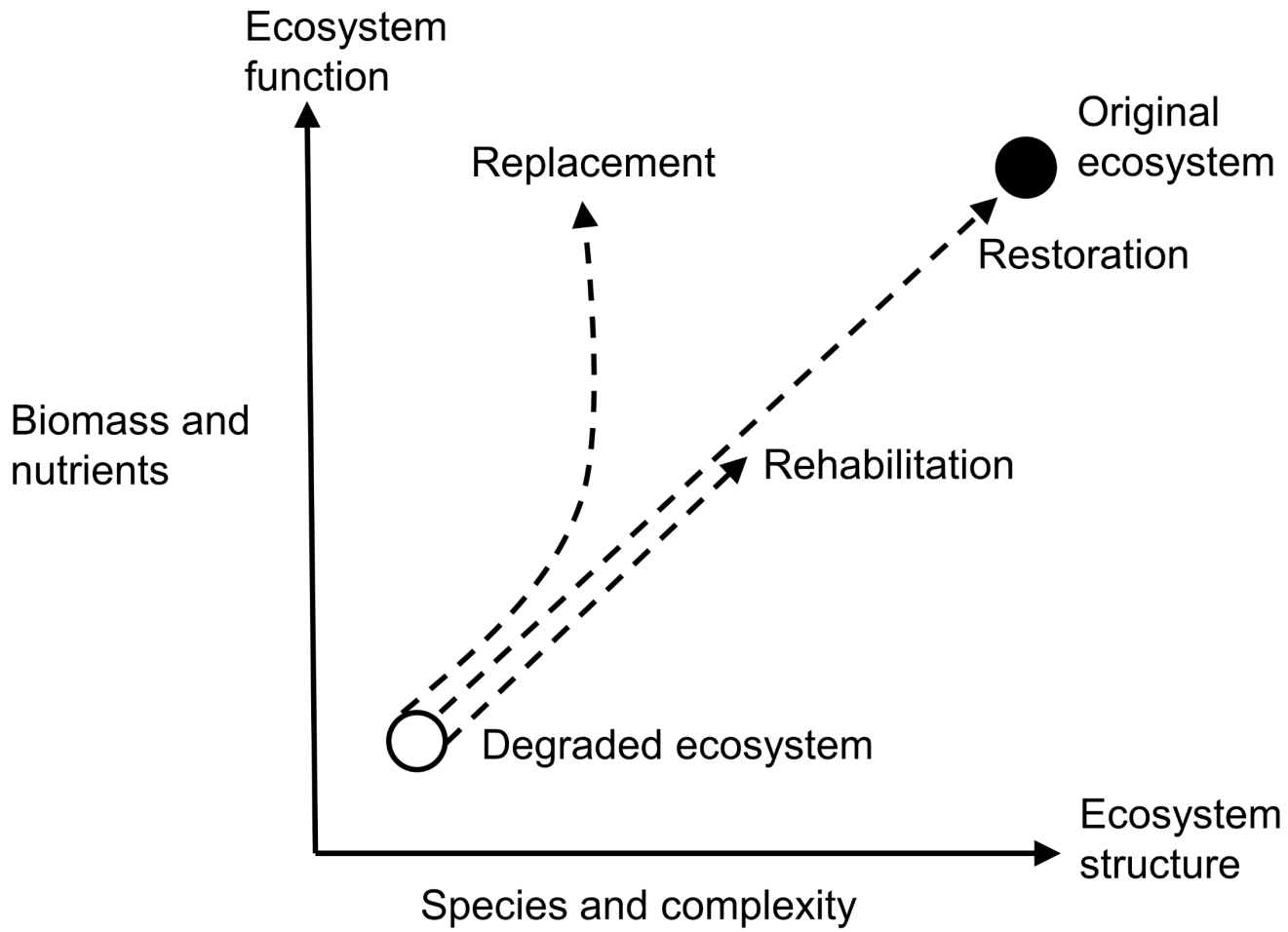

Figure 2.1. Classic view of restoration where anticipated recovery follows a linear recovery path toward the original ecosystem. Figure simplified and redrawn from Bradshaw 1984.

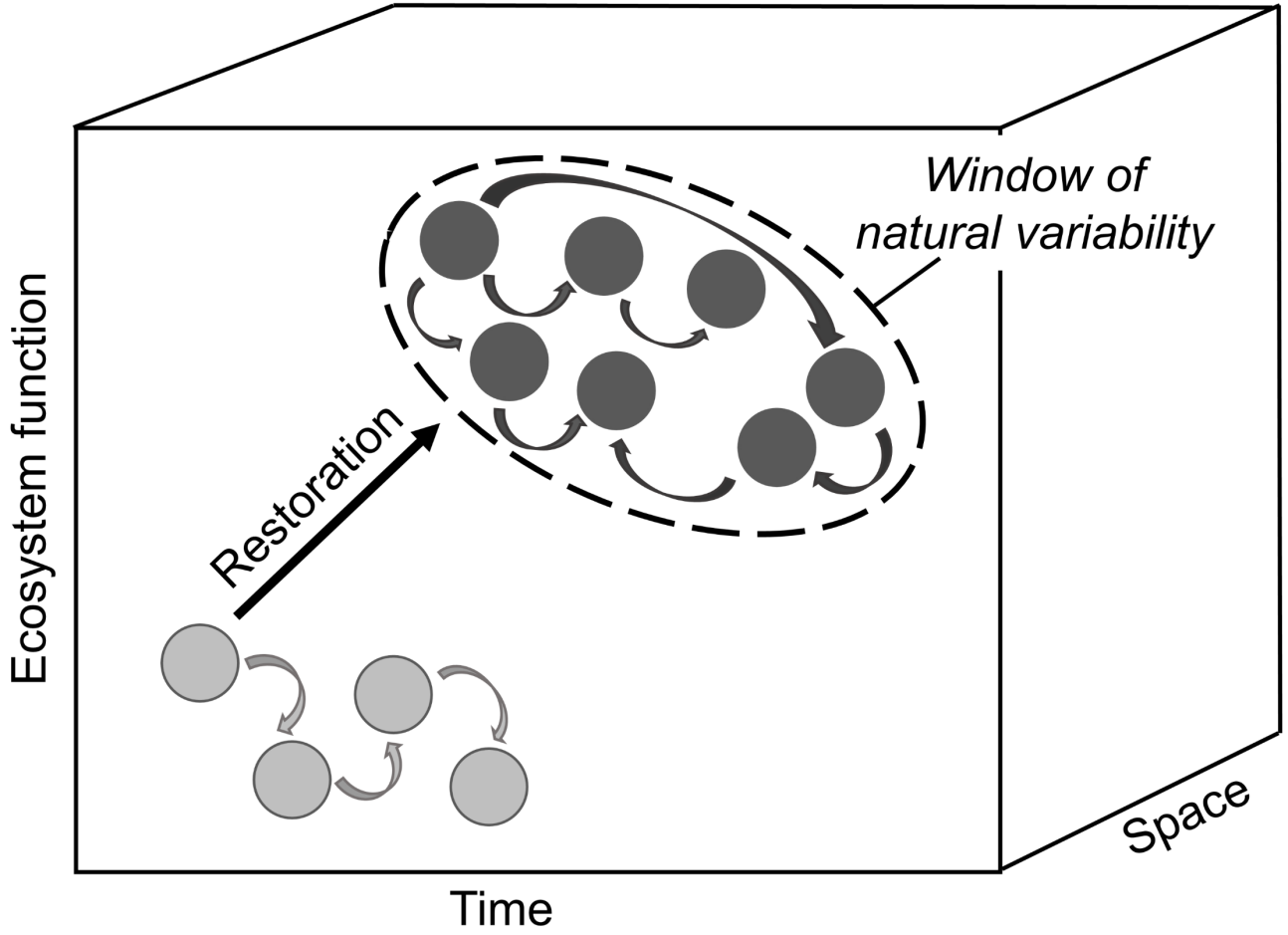

Figure 2.2. A more dynamic view of ecosystem recovery. All attributes of natural or reference ecosystems (dark grey spheres) vary over time and space within a natural window of variability (dashed oval line). When ecosystems move outside that window of natural variability (light grey spheres), restoration aims to set the ecosystem on a trajectory toward the natural or historic window of variability. Figure redrawn from Palmer et al. 2006.

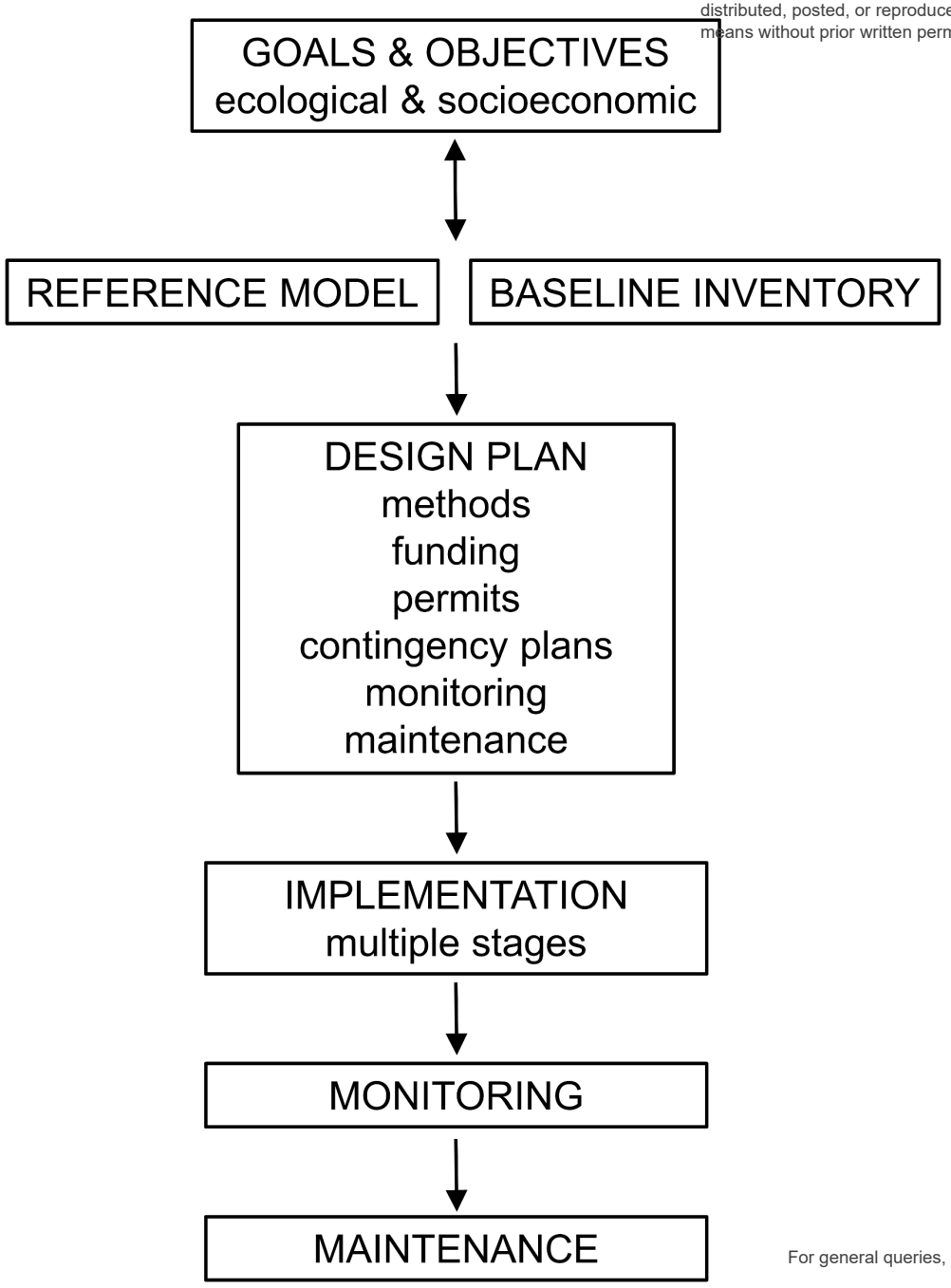

Figure 3.1. Steps in restoration project planning and implementation.

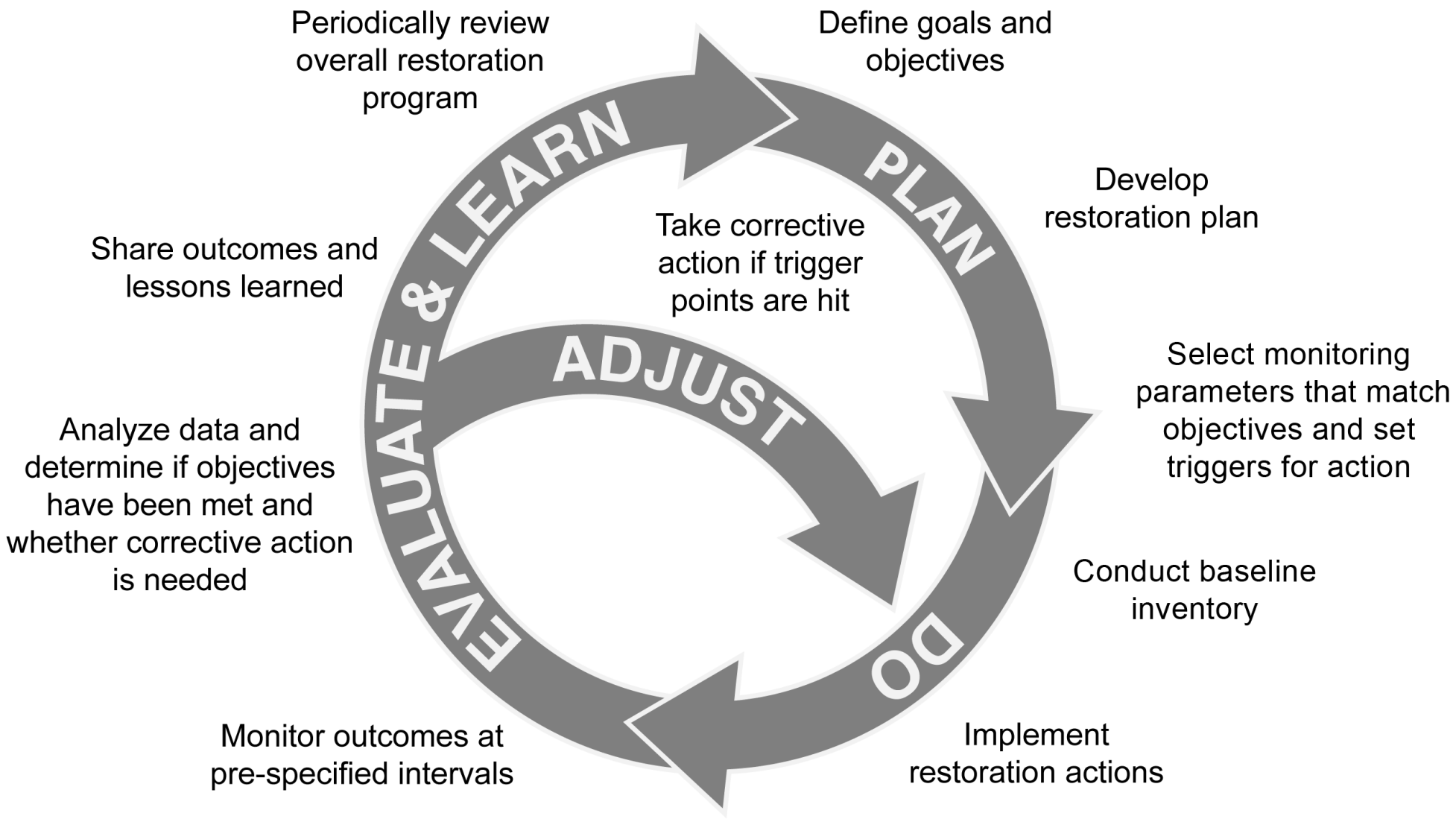

Figure 4.1. The multiple steps in the adaptive management cycle. Figure by A. Calle.

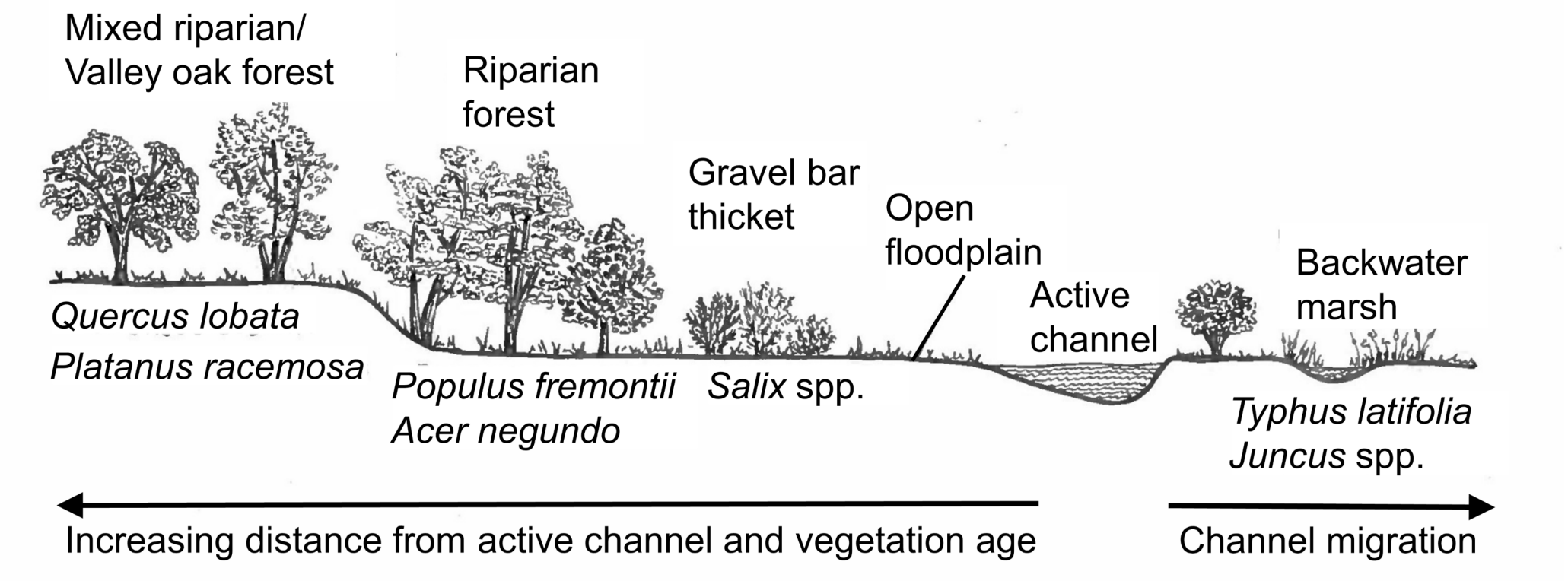

Figure 5.1. Conceptual model of the general distribution of riparian vegetation types in central California (Sacramento River case study) as a function of distance to active channel and successional stage. Modified from Greco (1999). Over time the right bank will erode during high flow events and the channel will move to the right exposing new open flood plain habitat that will slowly transition from early successional stages of gravel bar thicket to mid-successional riparian forest to later successional mixed/riparian valley oak forest. As old channels fill in over time this creates marsh habitat. Drawing by M. Pastor.

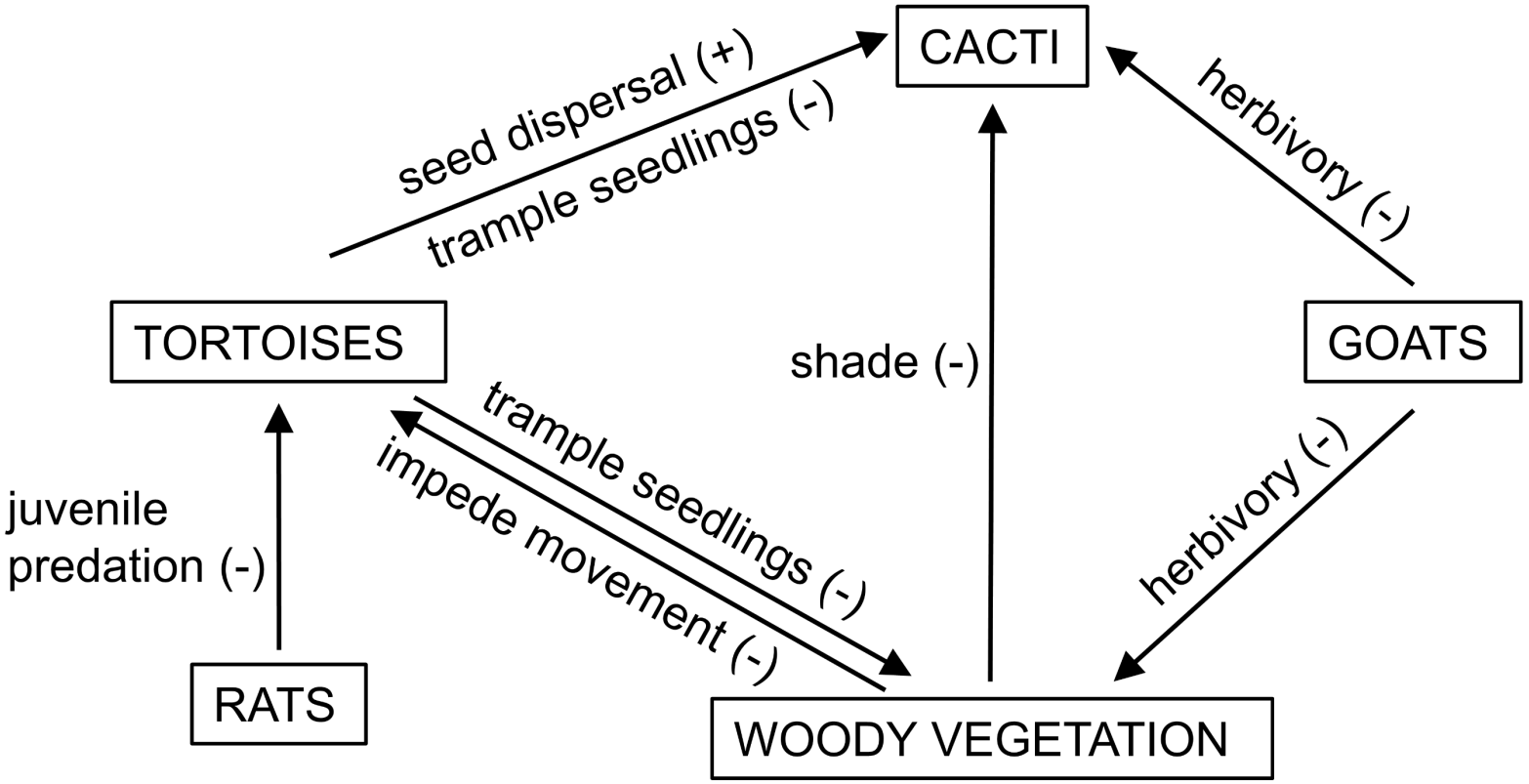

Figure 5.2. Complex interactions between Galapagos giant tortoises, native tree cacti, woody vegetation and introduced rats and goats (Galapagos Tortoise case study). (+) indicates a positive effect and (-) a negative effect of one organism on the other. Removal of an organism has the opposite effect, so removal of goats has a positive effect on both cacti and woody vegetation.

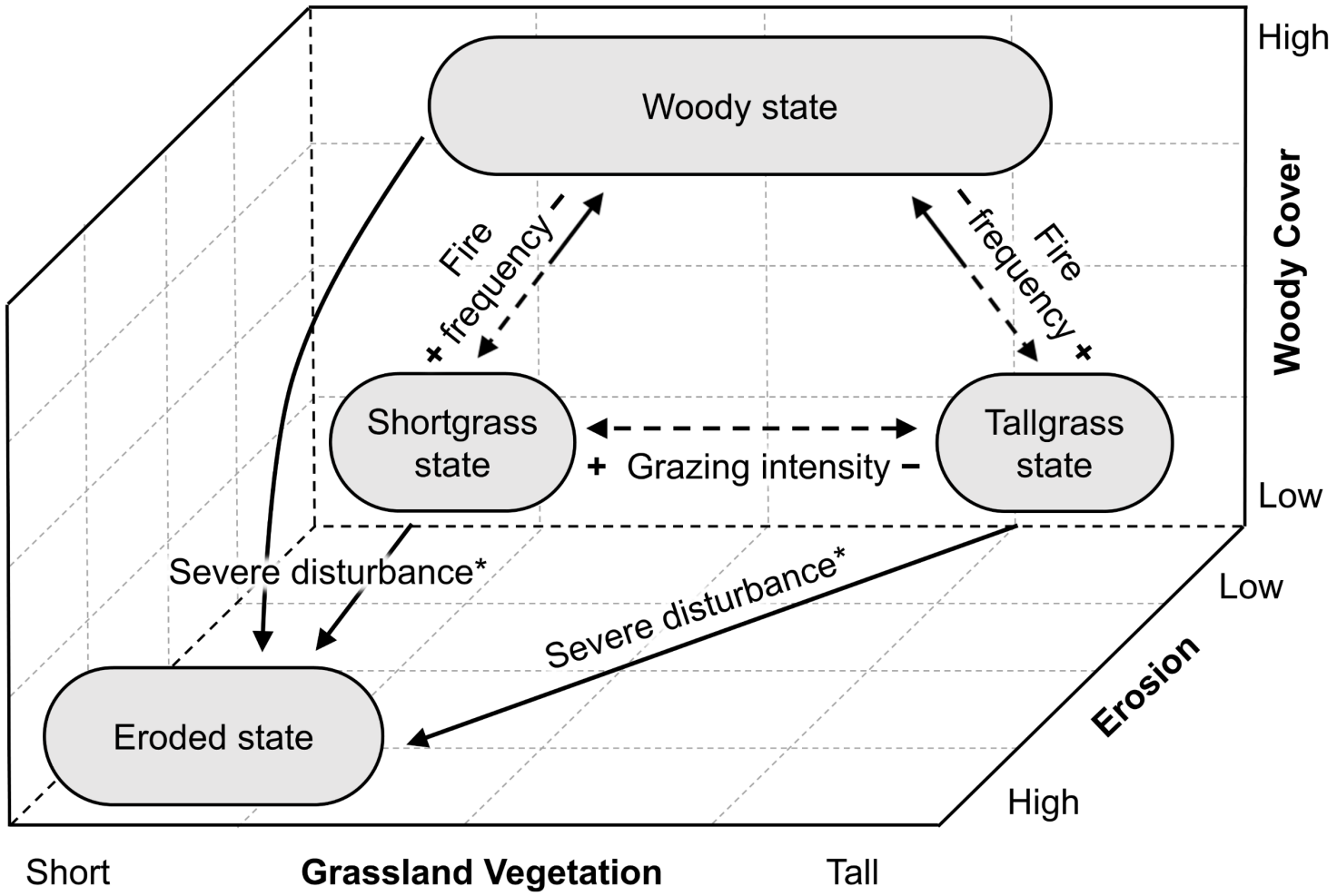

Figure 5.3. Conceptual model of alternative states in grassland ecosystems in the Midwestern United States. Dashed lines with arrows represent transitions that are reversible by managing the disturbance regime, and solid lines with arrows represent transitions that are difficult to reverse. Note that as woody cover becomes increasingly dense shifting back to a grassland state becomes more difficult. *Severe disturbances might include tilling for agriculture, overgrazing, catastrophic fires, or overharvesting of woody resources. Figure by J. Lesage. Modified from Briske et al. (2005).

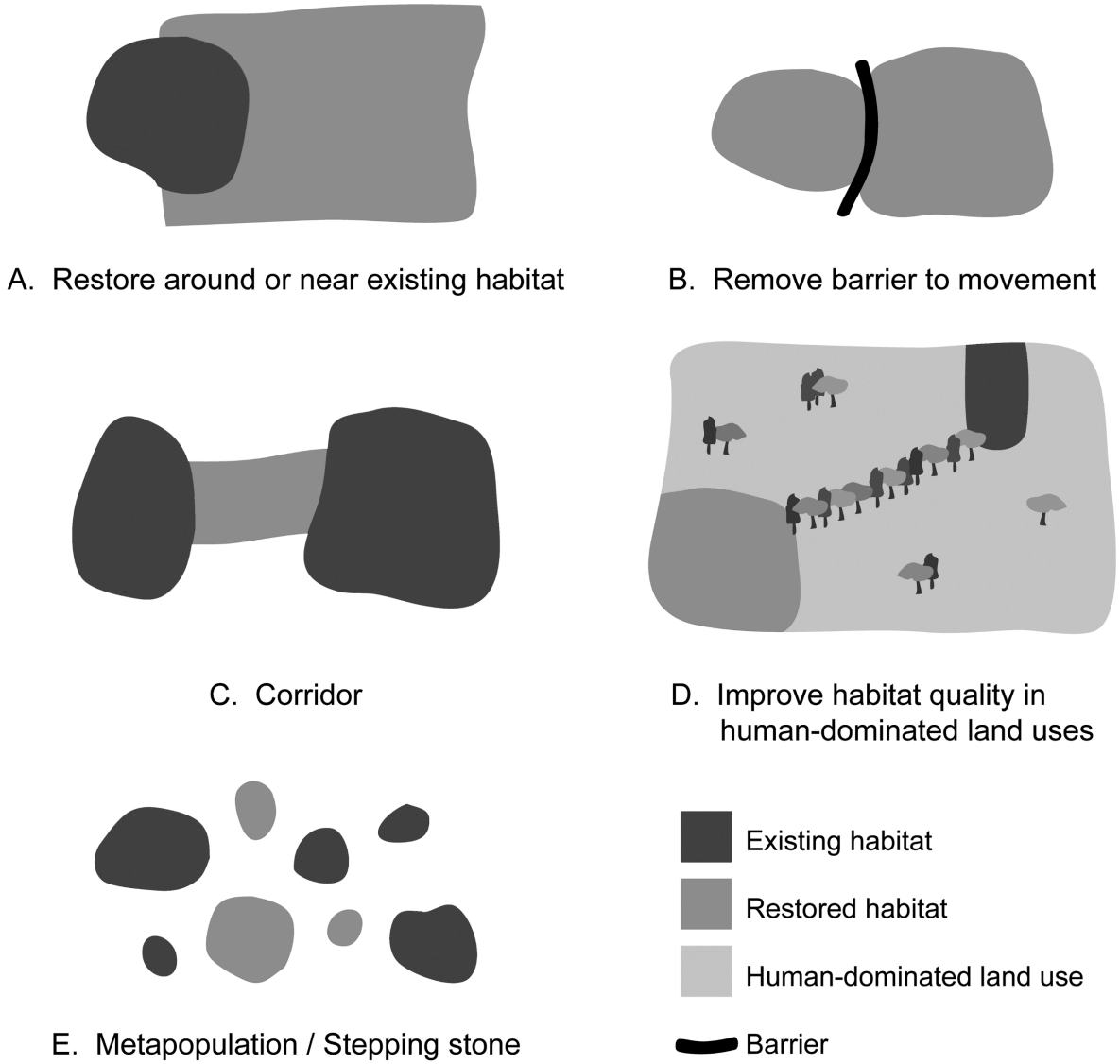

Figure 5.4. Approaches to increasing habitat connectivity through restoration. Figure by A. Calle.

Supplemental Figure Chapter 5.
The Trans-Canada Highway passing below a wildlife bridge. Photo by daveynin, licensed under CC BY 2.0.